Receiver-general of Finances. It is therefore probably derived either from Southern Arabia or from the opposite coast of Africa—that is to say, Nubia or Abyssinia. Unfortunately, M. Imhaus could not obtain from the owner of the animal any information that might serve to elucidate this question.—*Comptes Rendus*, April 22, 1867, pp. 812–814.

### *On the Spontaneous Movements of* Colocasia esculenta. By H. Lecoq.

There are few plants the organs of which do not spontaneously execute various movements: and here we distinguish these movements from those which are the result of some provocation, and which botanists designate under the name of *irritability*. Most of the spontaneous movements are due to the more or less rapid evolution of the organs, and the eye cannot follow them. We only know *Hedysarum gyrans* in which the leaves, or rather the two lateral leaflets, are endowed with regular movements visible at all times. I can add a new example of spontaneous oscillation, which was presented to me by *Colocasia esculenta*, Schott.

On the 13th January last, in passing through my stove, I thought I observed a slight movement in a leaf of *Colocasia*. I ascribed it at first to the displacement of the air by my passage; but a more careful examination proved to me that the movement occurred not only in the leaf which I had noticed, but also in four other leaves, the plant having only five in all. One leaf, smaller than the others, and at least one year old, was agitated like the younger ones. The movement was, in all, a sort of regular trembling, and was so sensible that the leaves of *Colocasia* communicated it to the neighbouring plants.

Every day after the 13th January, I carefully observed this plant of *Colocasia*, the only one in my stove, and noted the phases of its agitation. Sometimes this agitation persisted night and day; most frequently it occurred from 9 o'clock to noon, and then became weakened. The plant also had whole days, and even weeks of absolute repose. It then occurred to me, in order that I might be warned of the hours and periods of movement, to attach to my plant a certain number of little bells: these were not always sufficiently shaken to make them sound, but never failed to give me notice of the great crises.

Thus on the 18th January the agitation commenced at 2 o'clock A.M., and continued through a great part of the morning. The little bells rang, and the leaves of the *Colocasia* struck upon the neighbouring plants with sufficient force and distinctness to enable me, by means of a watch with a second-hand, to count the pulsations, which were from 100 to 120 per minute.

Several times I had the opportunity of witnessing violent fits of shaking,—among others, on the 20th January and 2nd March. On the latter day, in the morning, although the temperature of the stove was lowered to 7° C. (=45°·6 F.), the agitation was considerable

in all the leaves, both old and new, without exception: it is an actual febrile movement, a violent shivering. It is especially perceptible along the undulated margins of the leaves, and on the two raised auricles, which are merely prolongations of the limb beyond the petiole. The pulsations, still numbering from 100 to 120 per minute, had force enough to communicate the movement to the pot which contained the plant; and, although it weighed from ten to twelve kilogrammes, the hand and the strength of a man did not prevent it from shaking. This rhythmic agitation was also communicated to a fine leaf of *Strelitzia Nicolai* and to a large leaf of *Philodendrum pertusum*, which last passed the impulse to some fine flowering groups of *Begonia manicata*.

We have not yet been able to ascertain the circumstances which seem to determine the movement, nor those which appear to oppose it, although we have observed it every day for three months.

In the first place, we may almost deny the action of temperature, although its influence is considerable upon the development of the Aroïdeæ, since they disappear geographically from the cold regions of the earth. We have not seen the movements of the *Colocasia* increased by a temperature of 30° C. (=86° F.), nor have we seen them slackened by a temperature of 7°.

Is it the development of the new leaf, which is always very rapid, that excites the agitation? This seemed to us to be the effect of the leaf produced in January. The movement, at all times not very regular and without fixed periods, ceased when the leaf had nearly attained its growth. But in the case of the leaf produced in February the agitation did not commence until after the nearly complete development of the limb. Why should there be this difference?

Eminent botanists have paid attention to various physiological phenomena presented by *Colocasia esculenta*. MM. Schmidt, Duchartre, and C. Musset have published very important memoirs upon this plant, and have all occupied themselves with the emission of sap by its leaves. M. C. Musset especially has determined with precision the various phases of this transpiration, and ascertained that during præfoliation the sap was projected to a distance of several centimetres, through two orifices, in the form of stomata, situated at the apex of the leaf. M. Musset was able to count eighty-five drops projected in one minute—a number which may have some relation to the 100–120 pulsations per minute of our plant of *Colocasia*.

M. Musset had the kindness to send me his memoir; and I greatly desired to see, as he had done, the fine drops shooting forth from the apex of the unexpanded leaf. I have never been able to observe them; moreover the stomata of the apex have never presented an orifice. At no period could I observe a single drop suspended from the leaf, or falling from the extremity of its limb; there was no trace of humidity or of transpiration. I had, in a cooler house, a tuft of *Calla æthiopica* placed in a basin; and each leaf every moment let fall upon the water the result of its transpiration.

In another stove, also situated at Clermont, I observed a *Colocasia*

precisely similar to my own, which allowed its pearl-like drops to escape from the extremities of its leaves.

Is the remarkable and sometimes violent movement of my *Colocasia* due to an exception—namely, the accidentally imperforate condition of the stomata, and the incessant shocks of an imprisoned sap?

On the other hand, M. Musset says that the leaves of his *Colocasia* present violet reflections on their upper surface; mine is throughout of a pale green. Can we have studied different varieties?

M. Musset carried on his cultivation in the open ground; I mine in a hot stove: the difference of the stations may have had some influence upon the results. Might there not be, also, in these energetic spontaneous movements some transformation of heat into motion, just as in the Arums there is a development of heat at the moment when fecundation is about to take place.—*Comptes Rendus*, April 22, 1867, pp. 805–808.

*Characters of new Fishes.* By Dr. F. Steindachner.

*Ctenotrypauchen*, g. n.—Distinguished from *Trypauchen* by its large cycloid scales, an elevated dentated ridge on the occiput, and only three branchiostegal rays.

*C. chinensis.*—Length of head contained about $5\frac{3}{5}$ times, depth of head about $6\frac{1}{3}$ times in the total length. Eyes extremely small, scarcely visible externally; body elongated, ribbon-like. Dorsal, anal, and caudal fins united into a single fin. The dorsal contains 6 spines and 46 jointed rays, the anal 1 spine and 42 jointed rays. Along the lateral line 46 scales. Colour light yellowish brown, with a narrow reddish-violet band along the lateral line. China.

*Ieros Troschelii.*—Distinguished from *H. urophthalmus* by the greater number of dorsal spines (16), and by the lower jaw overhanging the upper only on the sides. Mexico.

*Ctenolabrus Brandaonis.*—Dorsal spines 19; 5–6 rows of scales above the lateral line; depth of body contained $3\frac{2}{5}$ times, and length of head $4\frac{1}{4}$ times in the total length; 5 rows of scales beneath the cheeks; 37–38 scales along the lateral line. Brazil.

*Batrachus liberiensis.*—Body completely and distinctly scaled; second dorsal with 25, anal with 22 jointed rays; head one-third the length of the body (without the caudal); breadth of the head six-sevenths of its length. No tentacle over the eye. Liberia.

*Caranx macrops.*—Forms a transition towards *Vomer* by the small elevation of the first dorsal; the maxillary teeth lie in several rows one behind the other, and are exceedingly delicate and fine, with the exception of the larger cutting-teeth in the outer row. Depth of body contained $3\frac{1}{2}$ times, and length of head $4\frac{1}{2}$ times in the total length. Body finely scaled; 40 scutes along the lateral line; 8 transverse bands on the sides of the body. Liberia.

*Arius Capellonis.*—Nearly allied to *A. Heudelotii*, Val.; but the occipital region is much more strongly arched, the dorsal and anal fins are considerably higher, and the adipose fin much longer than